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ABSTRACT

This booklet is intended to help mainstreamed mentally retarded, emotionally disturbed, or learning disabled high school students acquire a basic understanding of the responsibilities and working conditions of computer service technicians and to practice basic math skills necessary in the occupation. The first section provides a brief introduction to the occupation by focusing upon those job tasks of a computer service technician with which the student is likely to be familiar. The next two sections deal with the work environment of the typical computer service technician and the training, education, and experience needed for the occupation. Exercises addressing basic math skills used by computer service technicians are provided. Various suggestions are listed for students interested in further exploring the occupation of computer service technician. A glossary and answer sheet conclude the booklet. (KC)

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MATH on the job

Computer Service Technician

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MATH ON THE JOB:

COMPUTER SERVICE TECHNICIAN

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MATH on the job

Computer Service Technician

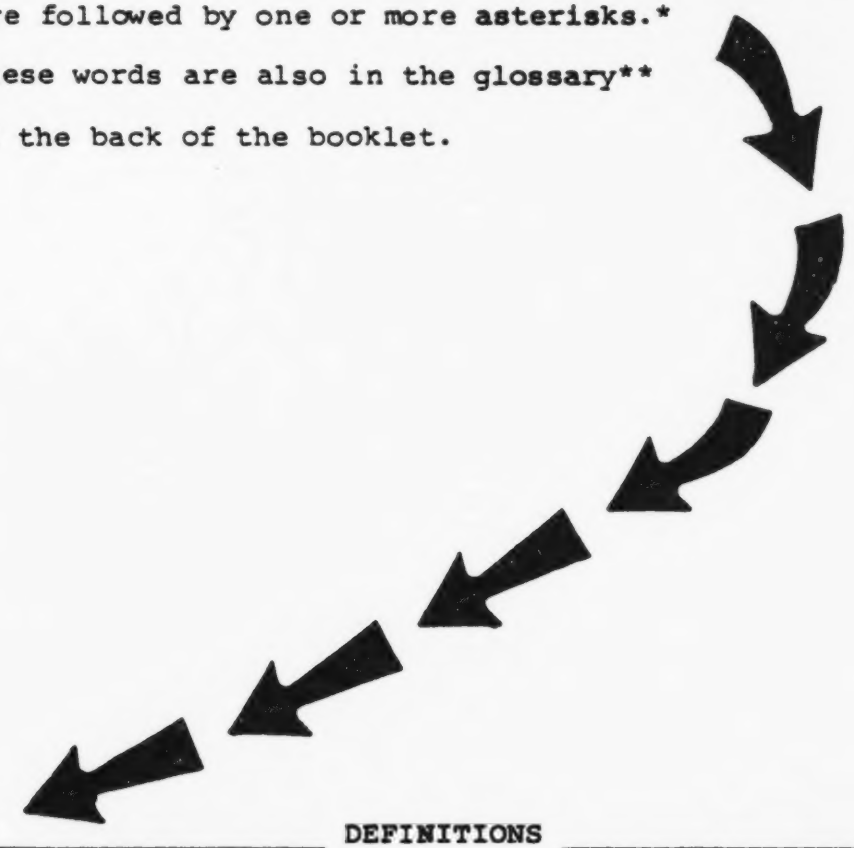
In this booklet, you can--

- find out what a computer service technician does
- see how a computer service technician uses math
- get a chance to use math as a computer service technician
- find out the types of things a computer service technician needs to know
- find out what courses, training, and experience you need to become a computer service technician

SPECIAL WORDS USED IN THIS BOOKLET

Workers in many jobs use special words or special meanings for words. Learning these words helps you to learn about a job.

You will find some of these special words in this booklet. When these words, and some hard words, are used for the first time, they are followed by one or more **asterisks.*** These words are also in the **glossary**** at the back of the booklet.



DEFINITIONS

*An asterisk (*) is a symbol that tells you to look at the bottom of the page for the meaning, or definition, of the word.

**A glossary is a list of words with their meanings.

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HAVE YOU EVER...

- watched someone install a computer at your school or home?
- seen someone repair a piece of electrical equipment such as a cash register, television, or record player?
- cleaned, or helped someone clean, a piece of electrical equipment?

Have you ever done any of these things? Then you have some idea about the work of a computer service technician. This booklet will help you learn about the work of a computer service technician and how math is important to do the job.

WHAT DOES A COMPUTER SERVICE TECHNICIAN DO?

A computer service technician installs and repairs computers. As a computer service technician, you will work with computers which perform such tasks as--

- making phone connections
- processing paychecks
- reserving tickets for travel, hotels, and entertainment

Your job as a computer service technician means you will keep these complicated computers in good working order. As a computer service technician, you will--

- clean, oil, and adjust mechanical parts in a computer
- check computer equipment for loose connections and faulty parts
- repair or replace faulty parts

Computer service technicians use math in their work every day. As a computer service technician, you--

- count, add, subtract, multiply, and divide
- use whole numbers, fractions, and decimals
- prepare customers' bills
- keep an **inventory*** of parts and supplies
- keep a record of time spent to install or repair computer equipment

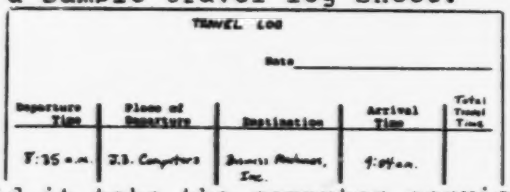
DEFINITIONS

*An inventory is a list or record of available materials such as parts and supplies.

A computer service technician uses math to keep track of travel time.

EXAMPLE

A computer service technician keeps a record of the time spent traveling to and from each work site. This written record is called a travel log. The following is part of a sample travel log sheet.



TRAVEL LOG

Date_____

Departure Time	Place of Departure	Destination	Arrival Time	Total Travel Time
8:35 a.m.	J.B. Computers	Business Machines, Inc.	9:04 a.m.	

How long did it take the computer service technician to drive from J.B. Computers to Business Machines, Inc.? To find this out, find the difference between the departure time and the arrival time listed on the log sheet.

9:04 - 8:35 = 29 minutes

The computer service technician took 29 minutes to drive from J.B. Computers to Business Machines, Inc.

NOW YOU TRY IT

Practice Exercise A

Use the sample travel log below to answer the questions which follow.

Departure Time	Place of Departure	Destination	Arrival Time	Total Travel Time
9:15 a.m.	Business Machines, Inc.	Ace, Inc.	9:37 a.m.	
11:49 a.m.	Ace, Inc.	Waycross General Hospital	11:09 a.m.	
1:39 p.m.	Business Machines, Inc.	Jackson Department Store	2:11 p.m.	
3:27 p.m.	Jackson Department Store	Maycross City Building	3:41 p.m.	

1. How long did it take the service technician to travel from Business Machines, Inc. to Ace, Inc.?

2. How long did it take the service technician to travel from Ace, Inc. to Waycross General Hospital?

3. What was the total travel time from Business Machines, Inc. to Jackson Department Store?

4. What was the total travel time from Jackson Department Store to Maycross City Building?

BEST COPY AVAILABLE

A computer service technician uses math to keep track of mileage.

EXAMPLE

A computer service technician keeps a record of the miles traveled to and from a work site. This written record is called a mileage log. A computer service technician uses a mileage log to record the place of departure, the destination, starting mileage, and ending mileage.

A computer service technician's car had a starting mileage reading of 10,985. After a trip to a local work site, the same car had an ending mileage reading of 11,008. How many miles did the computer service technician travel?

To find this amount, subtract the starting mileage reading from the ending mileage reading.

$$11{,}008 - 10{,}985 = 23$$

The computer service technician traveled 23 miles.

NOW YOU TRY IT

Practice Exercise B

Find the number of miles traveled in each of the following problems.

	Starting Mileage	Ending Mileage	Miles Traveled
5.	12,394	12,482	?
6.	32,861	33,010	?
7.	29,974	30,133	?
8.	17,015	17,082	?
9.	53,486	53,542	?
10.	10,990	11,049	?
11.	11,049	11,058	?
12.	11,058	11,067	?
13.	35,001	35,089	?
14.	44,699	45,003	?

A computer service technician uses math to figure out travel expenses.

EXAMPLE

Quite often computer service technicians use their own cars to travel to and from work sites. Most companies pay their employees for mileage. This payment is called a reimbursement. The driver is reimbursed at so many cents per mile, such as $.18 per mile.

A company pays a reimbursement amount of $.18 for every mile traveled to and from a work site. A computer service technician drove 64 miles to a work site. How much was the total reimbursement?

To find this amount, multiply the number of miles driven by the reimbursement amount per mile.

64 miles x $.18 = $11.52

The total reimbursement was $11.52.

NOW YOU TRY IT

Practice Exercise C

Find the total reimbursement amount for each of the following problems.

	Miles Driven	Reimbursement Amount/Mile	Total Reimbursement
15.	9	$.18	?
16.	12	$.18	?
17.	9	$.22	?
18.	48	$.22	?
19.	72	$.25	?
20.	98	$.25	?
21.	106	$.18	?
22.	311	$.16	?

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A computer service technician uses math to figure out meals and lodgings.

EXAMPLE

A computer service technician sometimes may need to stay overnight in another town to complete the work. During overnight visits, a computer service technician keeps a record of the cost of meals and lodgings. This written record is called an expense voucher.

A computer service technician keeps a record of each overnight visit. The following is part of a sample expense voucher.

LODGING AND MEALS (Must be itemized)

Date of Charge	Travel Point	Cost of Lodging	Cost of Meals (Itemize)			Total Amount Per Day
			Breakfast	Lunch	Dinner	
8/25	Greenville	$ 39.00	$ 3.50	$ 5.25	$12.00	
8/26	Columbia	$ 37.50	$ 2.85	$ 4.70	$14.90	
8/27	Greer	$ 32.00	$ 2.70	$ 3.95	$11.50	
8/28	Sparta	$ 28.00	$ 3.15	$ 4.85	$10.80	

What was the total amount the computer service technician spent for meals and lodging on 8/25? To find this amount, add the costs on the 8/25 line:

$39.00 + $3.50 + $5.25 + $12.00 = $59.75 Total

On 8/25, the computer service technician spent $59.75 for meals and lodging.

NOW YOU TRY IT

Practice Exercise D

Find the total meals and lodgings amount for each day listed. The first one is done for you.

LODGING AND MEALS (Must be itemized)

	Date of Charge	Travel Point	Cost of Lodging	Cost of Meals (Itemize)			Total Amount Per Day
				Breakfast	Lunch	Dinner	
	8/25	Greenville	$ 39.00	$ 3.50	$ 5.25	$12.00	$ 59.75
23.	8/26	Columbia	$ 37.50	$ 2.85	$ 4.70	$14.90	
24.	8/27	Greer	$ 32.00	$ 2.70	$ 3.95	$11.50	
25.	8/28	Sparta	$ 28.00	$ 3.15	$ 4.85	$10.80	
26.	8/29	Pickens	$ 42.50	$ 2.95	$ 5.90	$11.75	

WHERE DOES A COMPUTER SERVICE TECHNICIAN WORK?

As a computer service technician, you could work for a company which specializes in the installation and maintenance of computer equipment. Or you could work for a manufacturer of computer equipment. Regardless of where you work, your tasks will be the same. You will install and repair computer equipment.

When intalling or repairing computer equipment, you will work closely with customers. You will--

- listen to customers' complaints
- answer questions
- offer advice on ways to keep equipment in good condition

Computer service technicians use special types of equipment to perform their work. As a computer service technician, you use--

- wirestrippers to strip wire
- wirecutters to cut wire
- soldering guns to solder* wires or metal parts together
- voltmeters, ohmmeters, and oscilloscopes to measure the flow of electricity through a computer part or system

DEFINITIONS

*To **solder** means to melt a soft metal called solder. Heat is applied to the soft metal to melt it. This melted solder flows between two objects and fastens them together.

IF YOU ARE INTERESTED IN

THE WORK OF A COMPUTER SERVICE TECHNICIAN

AND WOULD LIKE TO KNOW MORE,

READ ON

WHAT TRAINING, EDUCATION, AND EXPERIENCE DO YOU NEED TO BECOME A COMPUTER SERVICE TECHNICIAN?

What do you think? Would you like to be a computer service technician? If you would, there are some things you should know.

To get a job as a computer service technician, you need to know how to used specialized tools and test equipment. You must also be familiar with technical procedures. The best way to learn these things is to take courses in math, physics, and electronics at your high school.

You will also need to attend a trade or technical school for training in electronics. Training programs take one or two years to complete.

You may also learn skills on the job by working with experienced technicians who will show you what to do. On-the-job training could take from 6 months to 2 years.

Taking every chance to learn new skills and tasks will help you do a better job. Good math skills will also help you perform your work as a computer service technician.

DO YOU WANT TO DO MORE COMPUTER SERVICE TECHNICIAN'S MATH?

Practice Exercise E

Use the sample travel log below to answer the questions which follow.

Departure Time	Place of Departure	Destination	Arrival Time	Total Travel Time
8:17 a.m.	Business Machines, Inc.	Acme Department Store	9:03 a.m.	
11:21 a.m.	Acme Department Store	Machines 'R Us	1:15 p.m.	
2:[illegible] p.m.	Machines 'R Us	Hamilton Hospital	3:43 p.m.	
3:[illegible] p.m.	Hamilton Hospital	Business Machines, Inc.	4:13 p.m.	

27. How long did it take the computer service technician to travel from Business Machines, Inc. to Acme Department Store?

28. How long did it take the computer service technician to travel from Acme Department Store to Machines 'R Us?

29. What was the total travel time from Machines 'R Us to Hamilton Hospital?

30. How long did it take the computer service technician to travel from Hamilton Hospital to Business Machines, Inc.?

Practice Exercise F

Find the number of miles traveled in each of the following problems.

	Starting Mileage	Ending Mileage	Miles Traveled
31.	89,794	90,011	?
32.	11,097	11,103	?
33.	11,125	11,189	?
34.	52,602	52,639	?
35.	66,842	67,011	?
36.	84,999	85,043	?

Practice Exercise G

Find the total reimbursement amount for each of the following problems.

	Miles Driven	Reimbursement Amount/Mile	Total Reimbursement
37.	74	$.18	?
38.	74	$.22	?
39.	93	$.25	?
40.	67	$.16	?
41.	51	$.18	?
42.	498	$.22	?
43.	329	$.16	?
44.	599	$.22	?

Practice Exercise H

Find the total meals and lodging amount for each day listed.

LODGING AND MEALS (Must be itemized

	Date of Charge	Travel Point	Cost of Lodging Attach ALL Receipts	Cost of Meals (Itemize) Breakfast	Lunch	Dinner	Total Amount Per Day
45.	9/2	Sparta	$69.00	$4.09	$4.80	$11.45	
46.	9/3	Lima	$58.00	$3.75	$5.13	$12.25	
47.	9/4	Perkins	$24.95	$2.89	$5.17	$13.50	
48.	9/5	Knox	$47.32	$3.50	$3.95	$12.89	
49.	9/6	Pickens	$27.50	$2.95	$5.12	$15.00	

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DO YOU WANT TO EXPLORE SOME MORE?

1. Computer equipment often is maintained or repaired at the site where the equipment is being used. What are some things you would like about traveling to business sites to maintain and repair computers? What are some things you would not like?

2. Computer technicians are often called to make emergency repairs. They must be prepared to provide emergency services to customers at any hour. Would you like to work at a job that would require you to make service calls at any hour?

3. Visit your school or community library. Ask the librarian to help you find books about computer careers.

4. Check your telephone book for a listing of companies that service computers. Call one or more of the companies and arrange a visit with a computer service technician. Find out what computer service technicians like and dislike about their jobs.

5. Banking is a highly computerized industry. Banks use computers to maintain records of customers' savings and checking accounts, loan payments, investments, and transfers of money. Visit a bank. Talk to someone who works in the computer department. Ask if computer service technicians have any effect on bank operations. What effect can or do they have?

6. Visit a large manufacturing business in your community. Find out how computers are used in that business.

7. Are you interested in other jobs which are similar to that of the computer service technician?

   - **Appliance repairers** maintain and repair large and small appliances such as washers, dryers, refrigerators, and food processors.

   - **Automotive electrical systems technicians** maintain and repair the electrical systems in cars and trucks.

- **Business machine repairers** fix and maintain business machines such as copiers, typewriters, cash registers, and calculators.

- **Television service technicians** maintain and repair television equipment such as receivers, transmitters, and cameras.

- **Radio repairers** fix and maintain radio equipment such as receivers, amplifiers, and tuners.

You must have good math skills to do these jobs well. Most of these workers add, subtract, multiply, and divide on the job every day.

GLOSSARY

Asterisk (*): a mark that tells you to look at the bottom of the page for the meaning, or definition, of the word.

Glossary: a list of words with their meanings.

Inventory: a list or record of available materials such as parts and supplies.

Solder: to melt a soft metal called solder. Heat is applied to the soft metal to melt it. The melted solder flows between two objects and fastens them together.

ANSWER SHEET

Practice Exercise A

1. 12 minutes
2. 9 minutes
3. 41 minutes
4. 14 minutes

Practice Exercise B

5. 88
6. 149
7. 159
8. 67
9. 56
10. 59
11. 9
12. 9
13. 88
14. 304

Practice Exercise C

15. $1.62
16. $2.16
17. $1.98
18. $10.56
19. $18.00
20. $24.50
21. $19.08
22. $49.76

Practice Exercise D

23. $59.95
24. $52.15
25. $46.80
26. $63.10

Practice Exercise E

27. 46 minutes
28. 109 minutes or 1 hour, 49 minutes
29. 103 minutes or 1 hour, 43 minutes
30. 15 minutes

Practice Exercise F

31. 217
32. 6
33. 64
34. 37
35. 169
36. 44

Practice Exercise G

37. $13.32
38. $16.28
39. $23.25
40. $10.72
41. $9.18
42. $109.56
43. $52.64
44. $131.78

Practice Exercise H

45. $89.84
46. $79.13
47. $46.51
48. $67.66
49. $51.27